REMARKS

Thorough examination and careful review of the application by the Examiner is noted and appreciated.

Claims 1-20 are pending in the application. Claims 1-20 stand rejected.

Objection to the Claims

Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Claim 8 has been cancelled and withdrawn from further consideration by the Examiner.

Claim Rejections Under 35 USC §112

Claims 10 and 11 are rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 10 and 11 under 35 USC §112, second paragraph, is respectfully traversed.

Claims 10 and 11 have been amended to alleviate the Examiner's rejections. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claim Rejections Under 35 USC §102

Claims 1, 5 and 6 are rejected under 35 USC §102(b) as being anticipated by Komatsuzaki '945. It is contended that Komatsuzaki discloses a wafer treatment apparatus including "means for reciprocally moving the wafers holding means with wafers being immersed into the treatment solution".

The rejection of claims 1, 5 and 6 under 35 USC §102(b) based on Komatsuzaki is respectfully traversed.

Independent claim 1 has been amended to clearly recite a structural element of:

> "means for reciprocally moving said wafer holder in an up-and-down motion with said at least one wafer immersed in said stripper solution at a frequency of up to 100 cycle/min."

Komatsuzaki '945 discloses, in Fig. 4, at col. 4, lines 60-65:

> "The holder arms 10,10 are moved reciprocatively up and down by means of a mechanism with a cylinder and a piston, cums, crankshafts and the like (not shown in the figures) so that the wafer materials 11,12 held by the sucking units 21,22 are also moved up and down along a radial direction of the rotatable disk 3."

Komatsuzaki does not teach means for reciprocally moving the wafer holder at a frequency of up to 100 cycle/min.

The rejection of claims 1, 5 and 6 under 35 USC §102(b) based on Komatsuzaki is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 1 and 2 are rejected under 35 USC §102(b) as being anticipated by Weber et al '431. It is contended that Weber et al discloses means for lifting and lowering or reciprocating vertically the wafer receiving device at col. 7, lines 49-53.

The rejection of claims 1 and 2 under 35 USC §102(b) based on Weber et al is respectfully traversed.

The Applicants respectfully submit that while Weber et al discloses the substrate receiving device can be moved reciprocally in the vertical direction to lower and lift the wafers into and out of the fluid container, Weber et al does not teach means for reciprocally moving the wafer holder at a frequency of up to 100 cycle/min.

The rejection of claims 1 and 2 under 35 USC §102(b) based on Weber et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claim Rejections Under 35 USC §103

Claims 2, 9 and 15 are rejected under 35 USC §103(a) as being unpatentable over Komatsuzaki '945 in view of Erk et al '505. It is contended that while Komatsuzaki is silent about the use of heating means for the treatment solution, such is disclosed taught by Erk et al.

The rejection of claims 2, 9 and 15 under 35 USC §103(a) based on Komatsuzaki and Erk et al is respectfully traversed.

Erk et al discloses a method for cleaning semiconductor wafers with sonic energy and passing through a gas-liquid-interface wherein the surface of a wafer repeatedly passes through a gas-liquid-interface. As clearly shown by Erk et al in Figs. 2 and 3, and at col. 5, lines 52-63:

> "Operation of the motor 86 rotates the camming mechanism 62 about the axis X to simultaneously reciprocate and rotate the semiconductor wafers W. The reciprocation action causes the center C of each semiconductor wafer W to move up and down **between the upper level L_1** (Fig. 2)and the **lower level L_2** (Fig. 3). The **level 48 of cleaning liquid** in the bath 42 is selected to be generally **midway between the upper and lower levels L_1, L_2** ..."

Furthermore, at col. 6, lines 2-5, Erk et al stated:

> "As explained above, cleaning of the semiconductor wafers W in the sonic bath 42 is most effective **at or near the gas-liquid-interface 46**."

Erk et al therefore teaches a completely different cleaning method than that taught either by Komatsuzaki or the present invention. For instance, the present invention, as clearly recited in independent claims 1 and 9:

> "means for reciprocally moving said wafer holder in an up-and-down motion **with said at least one wafer immersed in said stripper solution** at a frequency of up to 100 cycle/min."

The Applicants respectfully submit that since Erk et al teaches a cleaning method in which a wafer is only half immersed in liquid and ultrasonic waves are used at the gas-liquid-interface, while Komatsuzaki teaches a method in which a wafer is **completely immersed** in a stripper solution, and cleaned by mechanical agitation in the cleaning solution. There can be no motivation to combine the teachings of Erk et al with that of Komatsuzaki. Komatsuzaki teaches a cleaning method in which a wafer is completely immersed in the etch solution without using ultrasonic energy. The Komatsuzaki reference therefore cannot be modified by the Erk et al reference in arriving at a §103(a) rejection since **there can be no motivation to combine two completely different methods** in arriving at the present invention.

The rejection of claims 2, 9 and 15 under 35 USC §103(a) based on Komatsuzaki and Erk et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 3 and 4 are rejected under 35 USC §103(a) as being unpatentable over Weber et al '431 in view of Applicants' admittance or separately over Komatsuzaki in view of Applicants admittance.

The rejection of claims 3 and 4 under 35 USC §103(a) based on Weber et al '431 in view of Applicants' admittance or separately over Komatsuzaki in view of Applicants admittance is respectfully traversed.

Claims 3 and 4 depend on independent claim 1, which the Applicants have amended to clearly recite the limitation of "means for reciprocally moving said wafer holder in an up-and-down motion with said at least one wafer immersed in said stripper solution at a frequency of up to 100 cycle/min." The Applicants respectfully submit that such is not taught or disclosed by either Weber et al, the Applicants' own disclosure or by Komatsuzaki.

The rejection of claims 3 and 4 under 35 USC §103(a) based on Weber et al '431 in view of Applicants' admittance or separately over Komatsuzaki in view of Applicants admittance is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claim 7 is rejected under 35 USC §103(a) as being unpatentable over Weber in view of Cardani et al '999. It is contended that while Weber is silent on the utilization of electrical heating means, such is taught by Cardani et al.

Claim 7 depends on independent claim 1 (through claim 2), which clearly recites the structural elements of "means for reciprocally moving said wafer holder ... at a frequency of up to 100 cycle/min." The Applicants respectfully submit that such is not taught or disclosed by either Weber or Cardani et al, either singularly or in combination thereof. A reconsideration for allowance of claim 7 is respectfully requested of the Examiner.

Claims 10 and 11 are rejected under 35 USC §103(a) as being unpatentable over Komatsuzaki in view of Erk et al and further in view of Ward et al '186. It is contended that while the

combined teaching of Komatsuzaki and Erk et al does not specifically provide for the stripper solution, however, it indicates that the disclosed apparatus can be used for any liquid treatment of any plate-like materials. Furthermore, it is contended that Ward teaches an aqueous composition containing DMSO and TMAH.

The rejection of claims 10 and 11 under 35 USC §103(a) based on Komatsuzaki, Erk et al and Ward et al is respectfully traversed.

As presented above, the Applicants have shown that Komatsuzaki and Erk et al involve a completely different art area of cleaning in both the degree the wafer is exposed to a cleaning solution and in the agitation of the cleaning solution. As such, the references of Komatsuzaki and Erk et al cannot be combined in a §103(a) rejection for the base claim 9, onto which claims 10 and 11 depend. The additional reference of Ward et al, while disclosing the chemical compositions, does not lend any additional weight in a §103(a) rejection based on the two main references of Komatsuzaki and Erk et al.

The rejection of claims 10 and 11 under 35 USC §103(a) based on Komatsuzaki, Erk et al and Ward et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 12-13, 16-17 and 20 are rejected under 35 USC §103(a) as being unpatentable over the combined teachings of Komatsuzaki, Erk et al and further in view of Noguchi '631. It is contended that Noguchi discloses the additional step of stationary soaking a substrate in a liquid.

As presented above, the Applicants have clearly shown that since the basic cleaning process disclosed in independent method claims 9 and 16 is not rendered obvious by Komatsuzaki and Erk, the Applicants respectfully submit that the additional reference of Noguchi, which does not teach a method step of reciprocally moving wafers up and down at a frequency of up to 100 cycle/min., does not lend any additional weight in a §103(a) rejection. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claim 14 is rejected under 35 USC §103(a) as being unpatentable over Komatsuzaki, Erk et al and further in view of Handbook of Semiconductor Wafer Cleaning Technology (The Book). It is contended that while Komatsuzaki and Erk et al are silent on the spin drying of wafers after cleaning, such is taught by The Book.

Claim 18 is rejected under 35 USC §103(a) as being unpatentable over Komatsuzaki, Erk et al, Noguchi and further in view of Ward et al.

It is contended that while Komatsuzaki, Erk et al and Noguchi are silent on the stripper solution composition, such is taught by Ward et al.

Claim 19 is rejected under 35 USC §103(a) as being unpatentable over Komatsuzaki, Erk et al, Noguchi and further in view of Handbook of Semiconductor Wafer Cleaning Technology (The Book).

It is contended that while Komatsuzaki, Erk et al and Noguchi remains silent on the spin drying of wafers after cleaning, such is disclosed by The Book.

The rejection of claims 14, 18 and 19 under 35 USC §103(a) based on the numerous references is respectfully traversed.

As previously presented above, the Applicants have clearly shown that the primary references of Komatsuzaki and Erk et al cannot be combined in arriving at the present invention independent claims 9 and 15, which contains the method step of reciprocally moving the wafers up and down at a frequency of up to 100 cycle/min., the other secondary references of The Book, Noguchi and Ward et al do not lend any additional weight in a §103(a) rejection. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Based on the foregoing, the Applicants respectfully submit that all of the pending claims, i.e. claims 1-7 and 9-20, are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

In the event that the present invention is not in á condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his

Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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